

A new Genus and Species of Fruit Bat from South India (*Chiroptera: Pteropodidae*)

BY

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(With six plates)

While studying the Megachiroptera deposited in the collections of the Bombay Natural History Society, Bombay, India, an undescribed species was noticed. With the peculiar characteristic of this new bat, a new genus, *Latidens*, is proposed.

LATIDENS gen. nov.

Characters: A moderate-sized megachiropteran bat of the Cynopterine section of the subfamily Pteropodinae as defined by Andersen (1912, p. xcv). It possesses only one pair of upper and lower incisor, $I = \frac{1-1}{1-1}$, a character known among the megachiroptera in *Dobsonia* (Palmer 1898), *Haplonycteris* (Lawrence 1939), and *Harpyionycteris* (Thomas 1896). However, *Harpyionycteris* is placed in the Subfamily Harpyionycterinae, recognized as possessing strongly proclivous upper incisors and upper and lower canines.

Latidens is easily separated from the other genera mentioned above by having the cheek teeth $\frac{4-4}{5-5}$. These are $\frac{5-5}{6-6}$ in *Dobsonia* and $\frac{4-4}{4-4}$ in *Haplonycteris*. The postorbital foramen is absent in *Latidens* as well as in *Aethalops*, *Balionycteris*, *Chironax*, *Haplonycteris*, *Thoopterus*, *Penthetor* and *Sphaerias*, but *Latidens* is separated by the number of incisors.

Koopman & Cockrum (1967, pp. 115-116) recognized 29 genera among the Subfamily Pteropodinae. Table 1 gives the tooth formulae for the genera among the Cynopterine section including *Latidens* gen. n.

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The cheek teeth of *Latidens* are very broad, especially the lower cheek teeth, which resemble those of *Thoopterus* and *Dyacopterus*².

TABLE I
TOOTH FORMULAE OF PTEROPODINAE
(CYNOPTERINE SECTION)

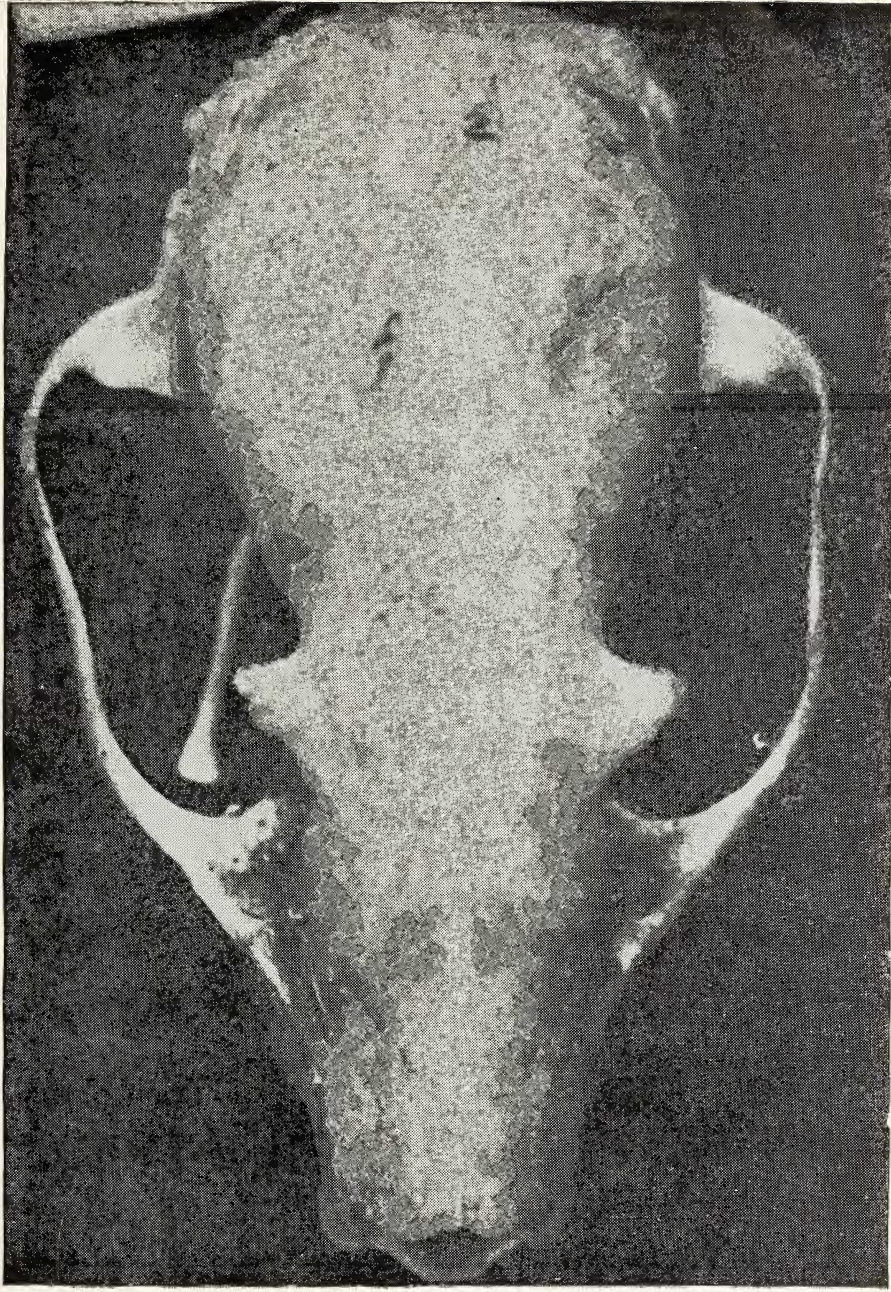
Genus			Incisors	Toothrow	Remarks
1. <i>Aethalops</i>	Thomas	1923	$\frac{2-2}{1-1}$	$\frac{4-4}{5-5}$	Malaysia
2. <i>Balionycteris</i>	Matschie	1899	$\frac{2-2}{1-1}$	$\frac{5-5}{5-5}$	Malaysia
3. <i>Chironax</i>	Andersen	1912	$\frac{2-2}{2-2}$	$\frac{4-4}{5-5}$	Malaysia
4. <i>Cynopterus</i>	F. Cuvier	1825	$\frac{2-2}{2-2}$	$\frac{4-4}{5-5}$	India & Malaysia
5. <i>Dyacopterus</i>	Andersen	1912	$\frac{2-2}{2-2}$	$\frac{3-3}{5-5}$	Borneo
6. <i>Haplonycteris</i>	Lawrence	1939	$\frac{1-1}{1-1}$	$\frac{4-4}{4-4}$	Philippines
7. <i>Megaerops</i>	Peters	1865	$\frac{2-2}{1-1}$	$\frac{4-4}{5-5}$	Thailand & Malaysia
8. <i>Myonycteris</i>	Matschie	1899	$\frac{2-2}{2-2}$	$\frac{5-5}{6-6}$	Africa
9. <i>Penthetor</i>	Andersen	1912	$\frac{2-2}{1-1}$	$\frac{4-4}{5-5}$	Malaysia
10. <i>Ptenochirus</i>	Peters	1861	$\frac{2-2}{1-1}$	$\frac{4-4}{5-5}$	Philippines & Borneo
11. <i>Sphaerias</i>	Miller	1906	$\frac{2-2}{2-2}$	$\frac{4-4}{5-5}$	Burma & Thailand
12. <i>Thoopterus</i>	Matschie	1899	$\frac{2-2}{2-2}$	$\frac{4-4}{5-5}$	Celebes
13. <i>Latidens</i> gen. n.	K. Thonglongya	1971	$\frac{1-1}{1-1}$	$\frac{4-4}{5-5}$	South India

The rostrum of the skull is rather elongate, narrow and thickened. The orbitonasal length is about 28% of the occipitonasal length. The palate is narrow and very long especially the postdental palate³.

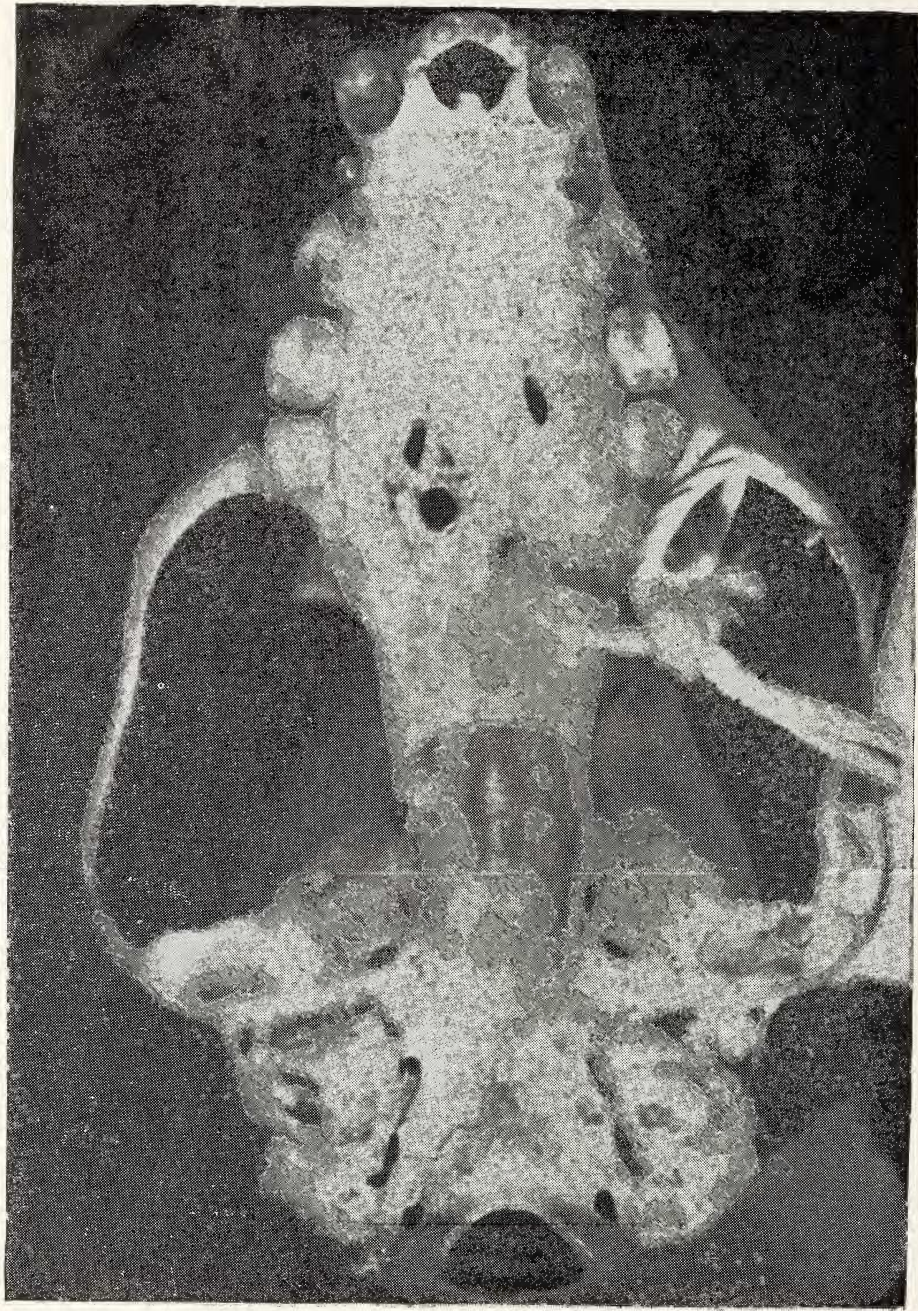
Type Species : *Latidens salimalii* sp. nov.

² John Edward Hill, who reviewed this manuscript and saw the specimen of *Latidens* remarked as follows, 'While the cheek teeth of *Latidens* are broad, they are by no means as broad as the very aberrant cheek teeth of *Thoopterus* : neither, apart from their width do they resemble those of *Dyacopterus*, in which the cusp pattern is basically that of *Cynopterus*. The cheek teeth (i.e. pm₃, pm₄, m₁ and m₂) of *Latidens* in fact closely resemble those of *Penthetor*, except that they are little wider, m₁ is square, not tapered posteriorly and does not extend posteriorly beyond the ventral margin of the orbit, while pm₄ and m₁ have a low surface cusp, approaching *Thoopterus* in this respect.'

³ Hill further remarked : The rostrum is very similar to that of *Thoopterus* but is a little less massive and deep. It is not especially elongate in comparison with *Thoopterus* but is more slender, a feature reflected in the narrowness of the palate, especially anteriorly. The postdental palate is relatively longer than in most Cynopterine bats but is equalled in this respect by *Aethalops*.



Dorsal aspect of skull of $\times 5$



Ventral aspect of the skull $\times 5$

Latidens salimalii sp. nov.

Type : B.N.H.S. no. 1563, an adult, sex not recorded but probably male, collected by A. F. Hutton from High Wavy Mountains, Madura district, South India, about 2500 feet, on 2 May 1948.

DESCRIPTION : A medium sized bat, similar to *Cynopterus sphinx angulatus* but without external tail. The fur of the head is blackish brown with light greyish base, darker than that of the body. The body fur is dense and longer than *Cynopterus sphinx*, light brown in colour, about 5 mm long on the mid back. The fur of the underparts, including chin and throat is thinner and shorter than that of the upper parts and is light greyish brown in colour. The ear membrane is rather thin, oval in shape, without a white rim as in *Cynopterus*. The index claw is present. The nostril, as seen from dry skin, has a *Cynopterine* form. The wing membrane is brownish, rather thin, starting from the first toe of the foot, and with no white along the fingers as in *Cynopterus*. The third metacarpal is the longest, the fifth is a little shorter than the fourth, which, in turn, is shorter than the third. Hill (in litt.) inform that externally and in colour, this bat almost exactly resembles *Thoopterus*. The wing-indices of the *Cynopterine* section will be seen from the appendix. Compared with related genera, the calcar is rather short, about 2 mm long, measured from the dry skin.

APPENDIX

COMPARISON OF THE WING INDICES BETWEEN THE GENERA OF FRUIT BATS IN
CYNOPTERINE SECTION

Genus	FA	III	III ¹	III ²	IV	IV ¹	IV ²	V	V ¹	V ²	
		MC			MC			MC			
<i>Balionycteris</i>	(p. 656)	1000	719	512	616	697	404	384	714	347	342
<i>Chironax</i>	(p. 659)	1000	636	489	632	598	375	420	632	330	348
<i>Cynopterus</i>	(p. 592)	1000	640	429	568	599	326	378	625	305	336
<i>Dyacopterus</i>	(p. 653)	1000	703	452	548	677	394	335	690	303	290
<i>Haplonycteris</i> (Lawrence,	p. 34)	1000	714	—	—	637	—	—	689	—	—
<i>Megaerops</i>	(p. 648)	1000	658	467	585	620	357	375	643	313	321
<i>Myonycteris</i>	(p. 577)	1000	671	465	575	633	342	366	647	302	323
<i>Nyctimene</i>	(p. 689)	1000	708	536	658	646	404	453	678	334	375
<i>Penthetor</i>	(p. 668)	1000	650	423	602	609	631	398	617	278	327
<i>Ptenochirus</i>	(p. 644)	1000	645	436	594	604	339	373	628	309	337
<i>Thoopterus</i>	(p. 664)	1000	694	510	585	660	394	—	680	306	306
<i>Latidens</i> gen. n.		1000	684	471	620	658	363	400	654	318	

Remarks:—All these measurements were taken from Andersen (1912), the page numbers being given in parentheses. Lawrence gave only metacarpal measurements for *Haplonycteris*.

Skull : (pl. 1-pl. 6). The skull is long and massive, and slightly deflected. The rostrum is also heavy and thickened and the postorbital

process is very short but heavy, lacking the postorbital foramen. The lambdoidal crest is present on both sides but not well marked. The zygomatic plate is slender and narrow; the anterior part leaves the skull from the posterior end of pm^1 , and is attached to the skull at the posterior of m^1 (see plate 2). The interorbital foramen is large and oblong.

The palate is narrow and long when compared with related genera, especially the postdental palate, which is longer than usual among the *Cynopterines*. The palatal ridge is not present.

The bullae are small and not much swollen. An incipient but distinct 'basial pit' is present.

Dentition :

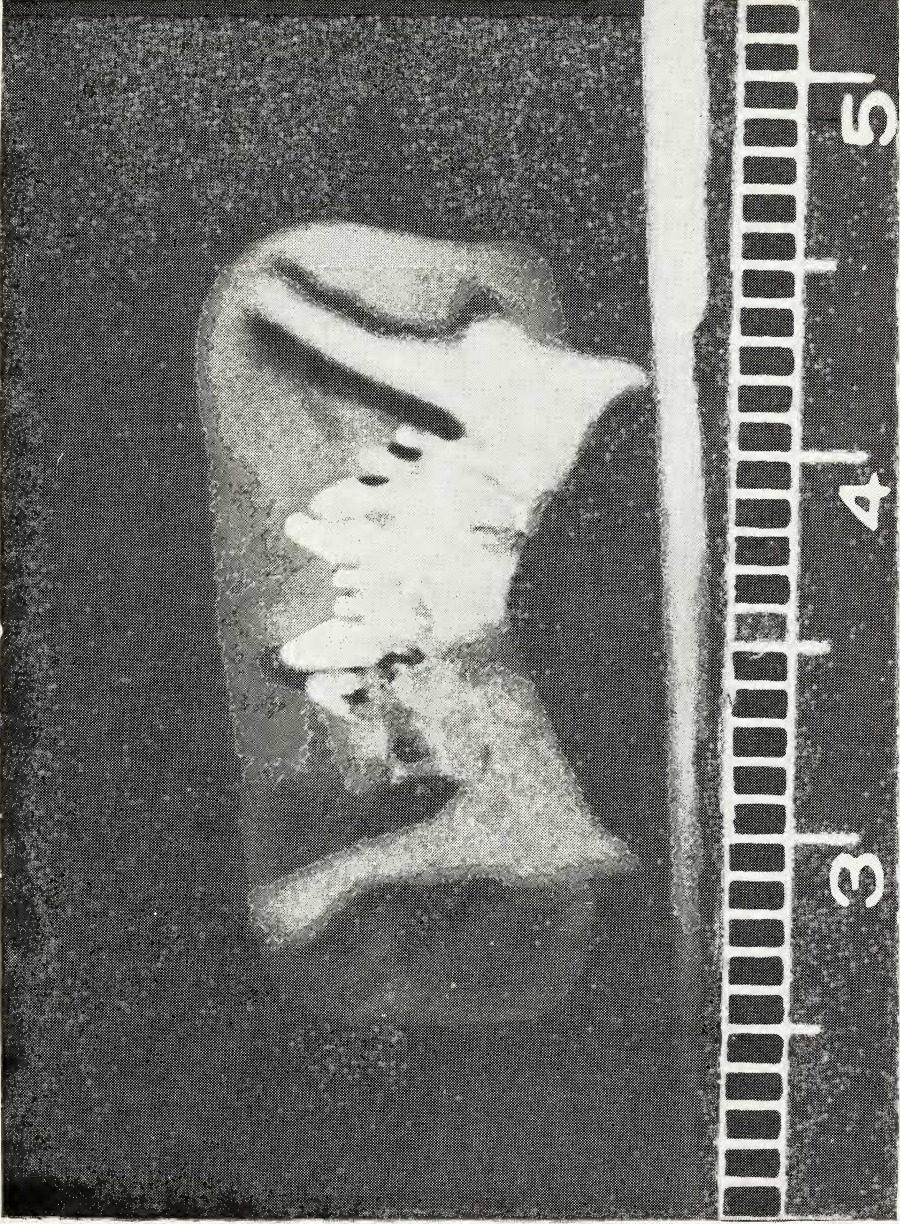
$$\frac{i^2 \ c \ pm^1 \ pm^3 \ pm^4 \ m^1}{i_2 \ c \ pm_1 \ pm_3 \ pm_4 \ m_1 \ m_2} \times 2 = 26$$

The upper incisors are styliform i.e. rod-like with flat crown. There is a little space between them and canines. The upper canine is smaller than that of *Cynopterus sphinx*, straight, with anteromedian groove, but having no secondary cusp. The first premolar (pm^1) is the smallest of the upper cheek teeth but comparatively larger than the first premolar among the other *Cynopterine* genera. It appears to be functional. Pm^3 is larger and higher than pm^4 , oval or subsquare in outline. Although pm^4 is shorter and smaller, it is much broader and rather more square than round or oval; also retains the anteroexternal cusp. M^1 is smaller than pm^4 as usual. The shape of this tooth is like pm^4 and it also retains the anteroexternal cusp, but is lower.

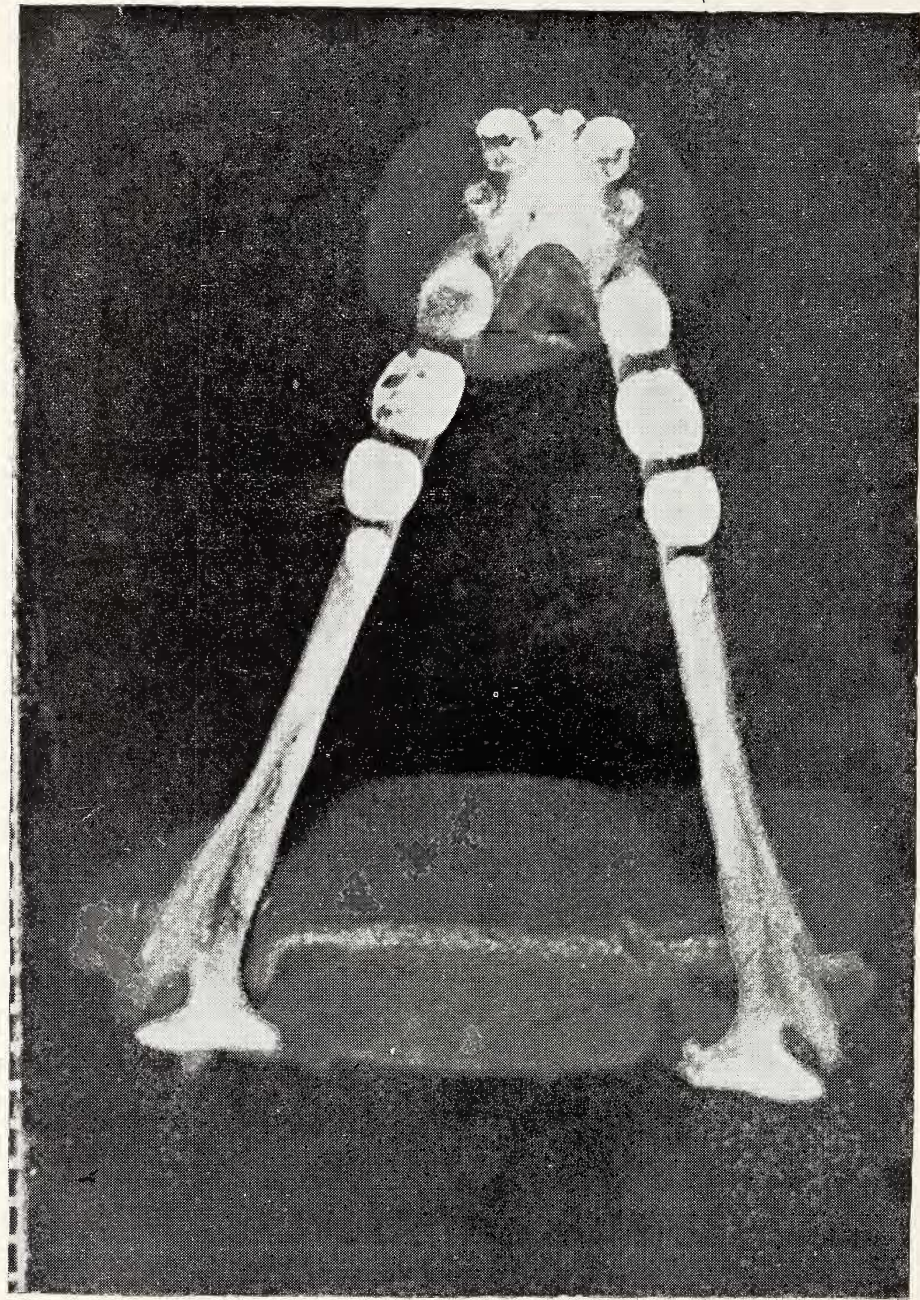
The lower incisor is also styliform but differs mainly from the upper incisor in being flat, sharp crowned rather than rounded. It is decidedly smaller than the upper incisor, about half the length of the lower canine. The lower canine is much smaller than the upper canine and set close to the lower incisor. It is much thickened at the posterior base but there is no well-defined secondary cusp. Pm_1 is also set close to the canine with a little space between them, and very small. Pm_3 is the highest and largest tooth of the lower toothrow, but it retains the posteroexternal cusp. Pm_4 is as large as pm_3 but much shorter and broader, subsquare in shape as in the other teeth. Only the anterior lower premolar (pm_1) has a clear outer cusp with a faint inner ridge. M_1 is also smaller than pm , also subsquare in outline, broader than pm_3 with a trace of central cusp. M_2 is about half smaller than m_1 , oval or rounded.

Measurements : As the collector gave no field measurements, all measurements here were taken from the dry skin and are given in millimetres.

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Thonglongya : *Latidens salimalii*



Anterior view of the lower mandible showing the lower incisors $\times 5$



EXTERNAL MEASUREMENTS

Forearm	67.5
Tibia	20.0
Calcar	2.0
Pollex (with claw)	24.5
Third metacarpal (III Mc)	46.2
*III ¹	31.8
III ²	42.0
Fourth metacarpal (IV Mc)	44.4
IV ¹	24.5
IV ²	27.0
Fifth metacarpal (V Mc)	44.1
V ¹	21.5
V ²	20.0 (shrunk)

*After Andersen in using III¹ for the first phalange of the third metacarpal, III² for the second phalange of the third metacarpal, IV¹ for the first phalange of the fourth metacarpal, and so on.

SKULL MEASUREMENTS

Greatest length	34.3
Occipitonasal length	32.1
Condylobasal length	33.8
Zygomatic width	21.3
Braincase width	13.7
Interorbital width	7.4
Postorbital width	7.7
Median palatal length	18.6
Length of postdental palate	6.3
Rostrum (orbitonasal length)	8.3
Breadth of rostrum between lachrymal foramina	8.0
Lachrymal width	10.0
c ¹ - c ¹ (alveoli, external)	6.1
m ¹ - m ¹ (crowns, external)	10.8
Breadth of palate at the posterior end	5.2
Length of upper toothrow (c - m ¹), alveoli	11.3
Length of lower toothrow (c - m ₂), alveoli	12.4
Length of upper mandible	25.0

MEASUREMENTS OF THE TEETH OF *Latidens salimalii*

	Upper tooth row	Lower tooth row
Height of canine	4.2	2.5
Third premolar (pm $\frac{3}{3}$) (L × W × H)	2.4 × 1.9 × 2.3	2.5 × 1.9 × 2.2
Fourth premolar	2.2 × 2.2 × 1.6	2.4 × 2.3 × 1.5
First molar	2.0 × 1.8 × 1.0	1.8 × 2.1 × 1.1
Second molar	—	1.2 × 1.1 × 0.5

Affinities with other genera in Pteropodinae :

This new bat no doubt belongs to the Cynopterine section as defined by Andersen (1912, pp. lvi-lxi). J. E. Hill (in litt.) suggested that *Latidens* is closely related to the Malaysian *Penthetor* and the Celebesian *Thoopterus*. I fully agree. It differs from *Penthetor* in the absence of the outer upper incisors (in *Penthetor*, however, these are reduced to one half of the length of the inner pair), in the longer, stronger, rostrum, and in having slightly wider $pm \frac{3-4}{3-4}$ and $m \frac{1}{1}$, in the square and not wedge-shaped outline of m^1 which does not extend posteriorly beyond the ventral margin of the orbit and in the presence of surface ridges on pm_4 and m_1 . In the features of rostrum, it is similar to *Thoopterus*: the widening of the teeth approaches but does not equal the extreme condition found in *Thoopterus* in which m_1 does not extend posteriorly and which has the similar but stronger surface ridges on pm_4 and m_1 . It may be considered that *Latidens* is the counterpart in India of the Malaysian *Penthetor* and Celebesian *Thoopterus*.

Specimen examined : 1, only the type.

Remarks : A. E. Hutton, the collector, mistook this bat for the common species in India, *Cynopterus sphinx*, and labelled it as such. In his paper (1949, a & b), he gave details about the type locality of this bat and made a note about *Cynopterus sphinx* as follows :—

‘*Cynopterus sphinx*. Short-nosed Fruit Bat, (Tamil : Baaval). The commonest in the hills where it is often seen in the evenings, flitting about the edges of the jungle, catching moths and other insects on the wing. (? Ed.)’

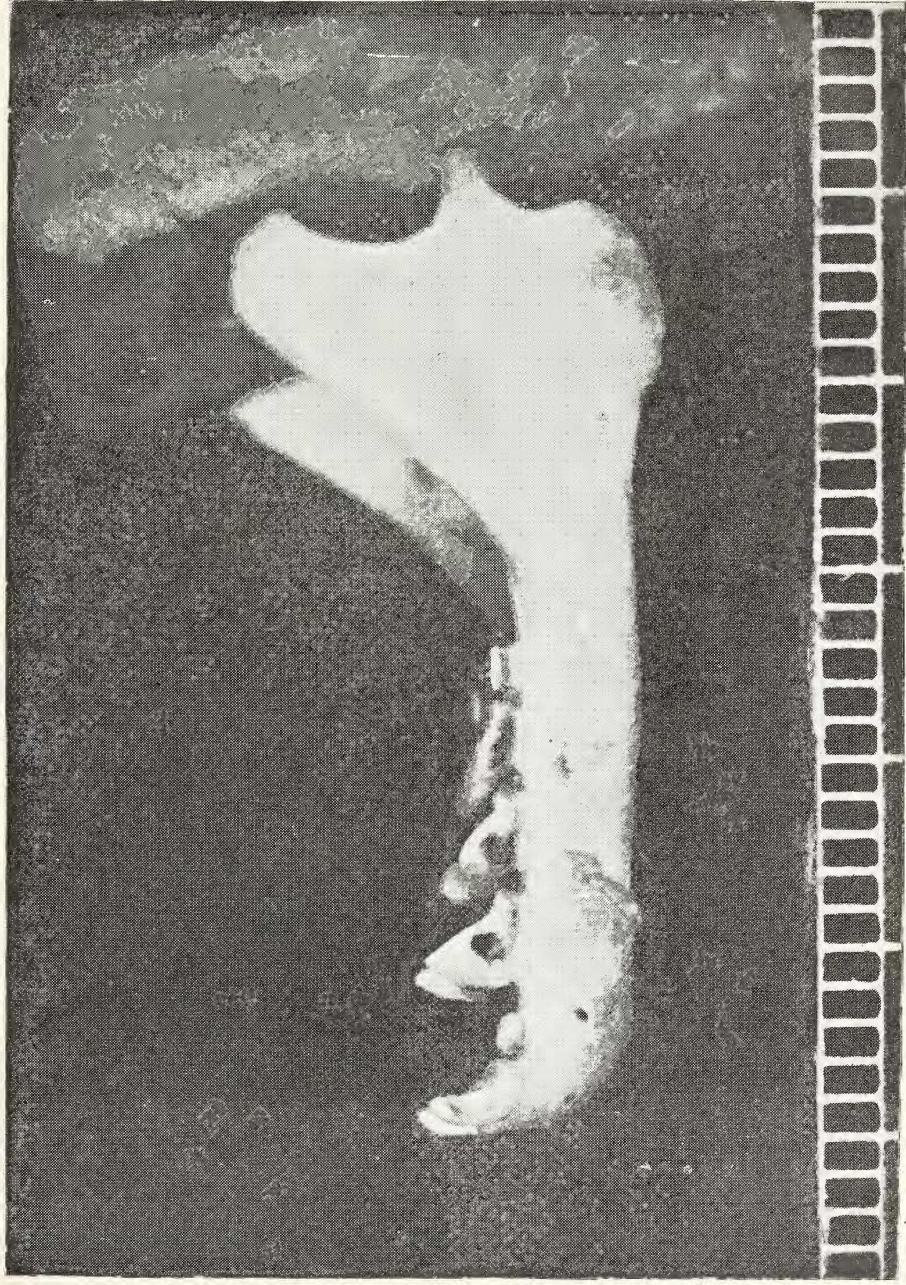
The bats listed by Hutton are :—

1. *Pteropus giganteus*
2. *Cynopterus sphinx*
3. *Scotophilus kuhli*
4. *Kerivoula picta*

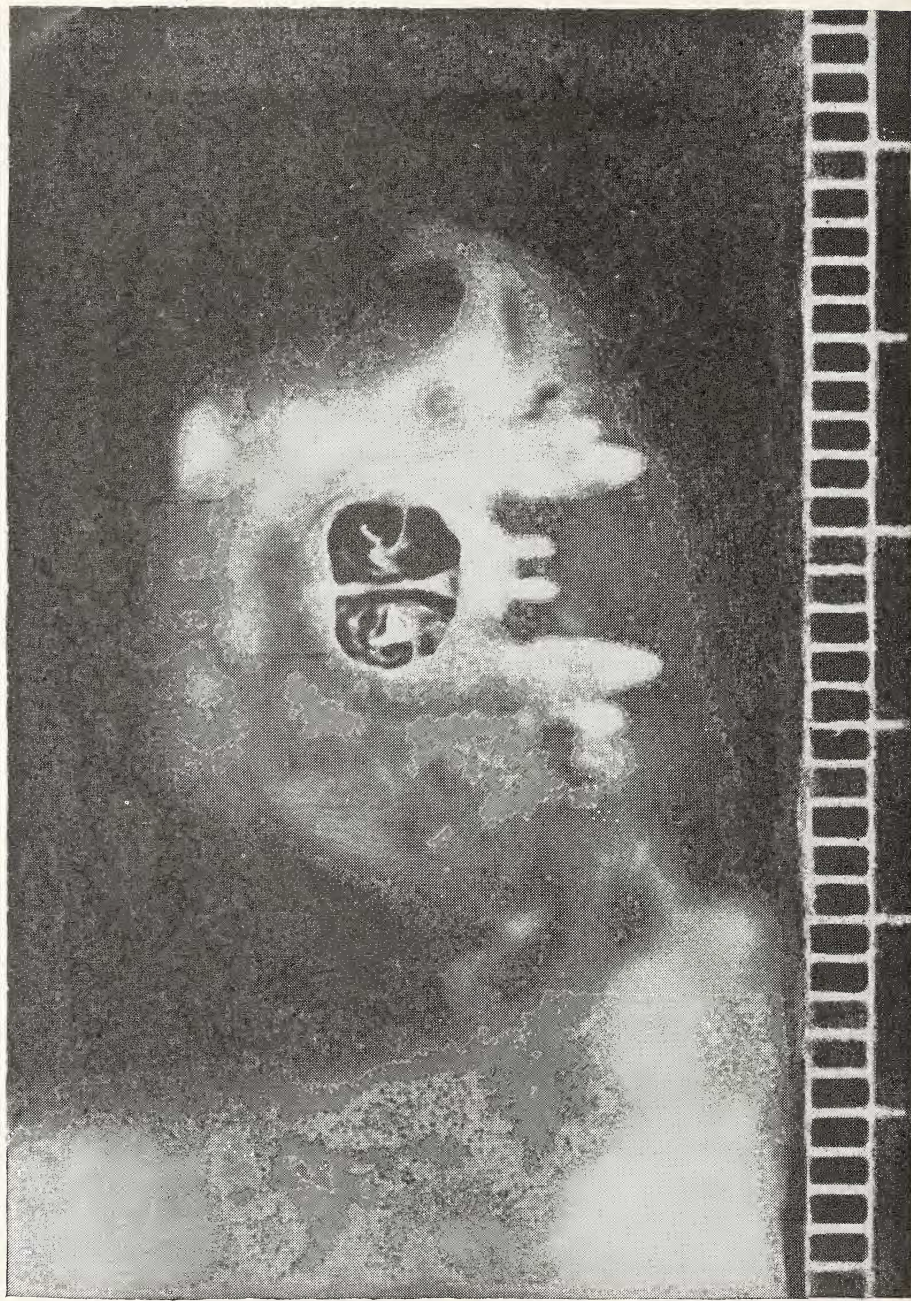
Also he added, ‘There are other bats in this area which I have not identified.’ As he believed the new bat was a common species, he collected only a single specimen and does not have *Cynopterus sphinx* in his collection.

Ellerman & Morrison-Scott (1966, pp. 90-100) listed only 6 species of fruitbats among Pteropodinae known from India. Recently, Bhat (1968, pp. 471-473) added *Sphearias blanfordi* as the seventh species. *Latidens salimalii* is thus the eighth species of fruitbat known from India.

It gives me great pleasure to name this new bat after Dr. Sálím Ali, the well known ornithologist of the Bombay Natural History Society, who has devoted his life to the study of Indian Natural History.



Side view of the Mandible $\times 5$



Anterior view of the skull showing the inner incisors $\times 5$

ACKNOWLEDGEMENTS

I wish to express my sincere thanks to Dr. S. Dillon Ripley and Dr. George E. Watson of the Smithsonian Institution who kindly arranged a grant for me to visit the Bombay Natural History Society where this new bat was discovered. Thanks are also due to Dr. Henry W. Setzer, Mr. Duane A. Schlitter of the Department of Mammals, Smithsonian Institution who gave me suggestions and replied to all my questions. I would like to express my deep indebtedness to Mr. John Edward Hill of the Mammal section, British Museum of Natural History for his useful criticism and suggestions and permission to use his comments in this paper. I am also indebted to Dr. Sâlim Ali, Mr. Humayun Abdulali, and the Honorary Secretary and staff of the Bombay Natural History Society for their kindness and generous hospitality while I was in Bombay. I wish to thank Dr. H. E. McClure, Mr. Norman C. Wake, Dr. Prasert Lohavanijaya, and Air Vice-Marshal M. R. Sukshom Kashemsanta for their kindness and for reviewing the manuscript. I am indebted to Miss Apsorn Kao Amphon for typing the manuscript.

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Note added in proof

After the manuscript was sent to the publisher, another two genera, *Alionycteris* Kock (1969, *Sencken. Biologica*, 50: 319-327), and *Otopteropus* Kock (ibid, pp. 329-338), were described recently. Hill (in litt.) wrote to me concerning these genera as follows:

"I have now compared *Latidens* with *Alionycteris* and *Otopteropus*. First of all there is no doubt at all that *Latidens* is quite distinct from either of these, and indeed, the further study that I have made reinforce my earlier conclusion that *Latidens* is most closely related to *Penthetor* and *Thoopterus*.

Alionycteris has the same tooth formula as *Latidens*, there being only one pair of upper and one pair of lower incisors. However, *Latidens* is very much larger, has the postorbital processes situated more anteriorly and its rostrum is wide anteriorly, not narrowed and slightly pointed as *Alionycteris*. The premaxillaries of *Latidens* project forward so that the incisors lie in front of the x canines, not in line with their anterior

faces as in *Alionycteris*, and the posterior part of the post-dental palate in *Latidens* is relatively much narrower than in *Alionycteris*. The upper incisors of *Latidens* are not convergent or in contact at the tips as in *Alionycteris*, while pm 4/4 (The third premolar) and m 1/1 are square in basal outline and not rectangular as in that genus: m¹ in *Latidens* is large and not reduced and pm₄ and m₁ have a low surface cusp, not presented in *Alionycteris*. I have not yet attempted to elucidate the relationships of *Alionycteris* but at first examination it seems to belong with the small genera such as *Balionycteris* and its allies. Despite the tooth formula, it lacks the broadening of pm 3/3 (the second premolar) —m 1/2 (especially of pm 4/4—m 1/1) so characteristic of *Latidens*: other points such as the relatively wide post-dental palate, anterior narrowing of the mandible, reduction of m 1/1 and the shape of pm 3/3 support my suggestion that it belongs with the small genera. There seems no evidence to suggest close affinity with large genera such as *Penthetor*.

Otopteropus has the same incisive formula as *Latidens* but has lost m₂. Again, *Latidens* is very much larger and also lacks any conspicuous thickening on the anterior and posterior margin of the ear. The post orbital process of *Latidens* are situated more anteriorly, and although the rostrum of *Otopteropus* is wider anteriorly than that of *Alionycteris*, it is still relatively narrower anteriorly than the rostrum of *Latidens*. The premaxillaries of *Latidens* project anteriorly more than in *Otopteropus*, it has relative narrower postdental palate. Again, the upper incisors of *Latidens* are not convergent or in contact as in *Otopteropus*, pm 4/4—m 1/1 are square in basal outline and not rectangular, m 1/1 are not reduced and pm₄ and m₁ have a low surface cusp. As you may have gathered, *Otopteropus* and *Alionycteris* are very similar in most respects, and it seems that *Otopteropus* also belongs with the small genera. As with *Alionycteris*, its cranial and dental features resemble these of small genera rather than the large genera such as *Penthetor*, *Latidens* and *Thoopterus*”.

I am indebted to Mr. Hill for his kindness in permitting me to quote his comments.

K. T.